CDF Operations Report

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All Experimenters' Meeting

This Week's Stores

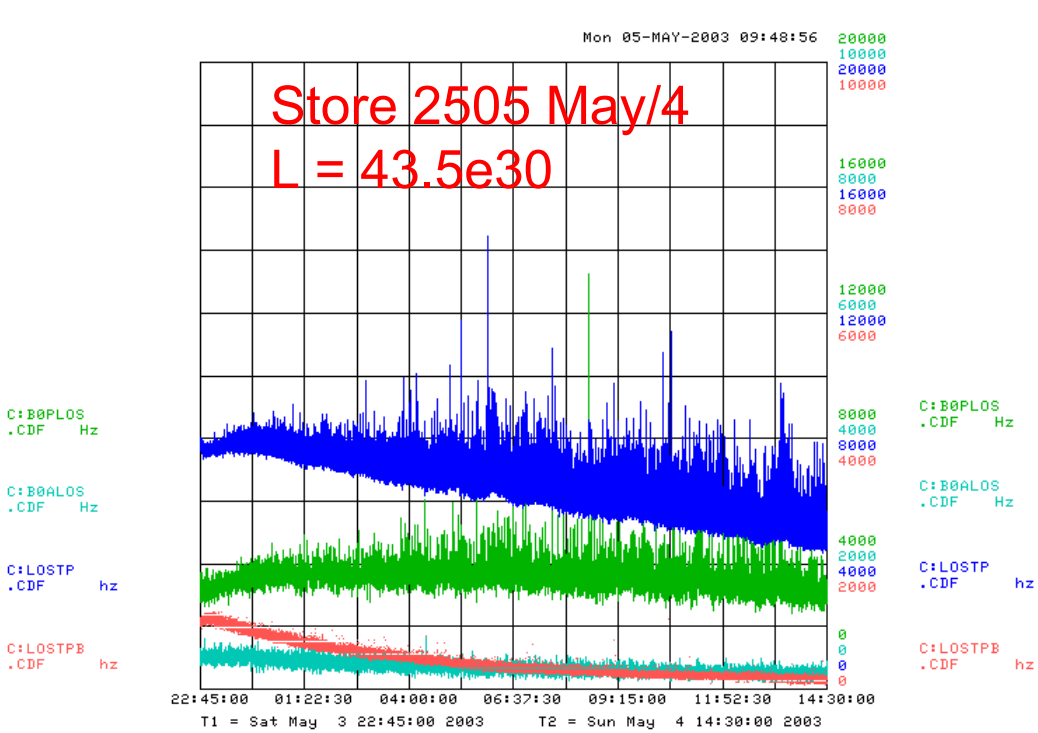
Date	Store	Duration (hours)	Initial L (10^{30})	Delivered (nb^{-1})	Live (nb^{-1})	ε
Su 5/11	2536	17.0	31.0	1136	1026	90.3%
Mo 5/12	2538	19.7	47.1	1620	1468	90.7%
Tu 5/13	2540	18.6	45.3	1592	1457	91.4%
We 5/14	2546	9.7	42.4	992	917	92.4%
Th 5/15	2549	18.1	46.8	1626	1443	88.8%
Fr 5/16	2551	18.3	45.4	1673	1215	78.6%
Sa 5/17	2555	17.0	47.5	1649	1553	94.2%
Total		118.4		10.3 pb^{-1}	9.1 pb^{-1}	88.3%

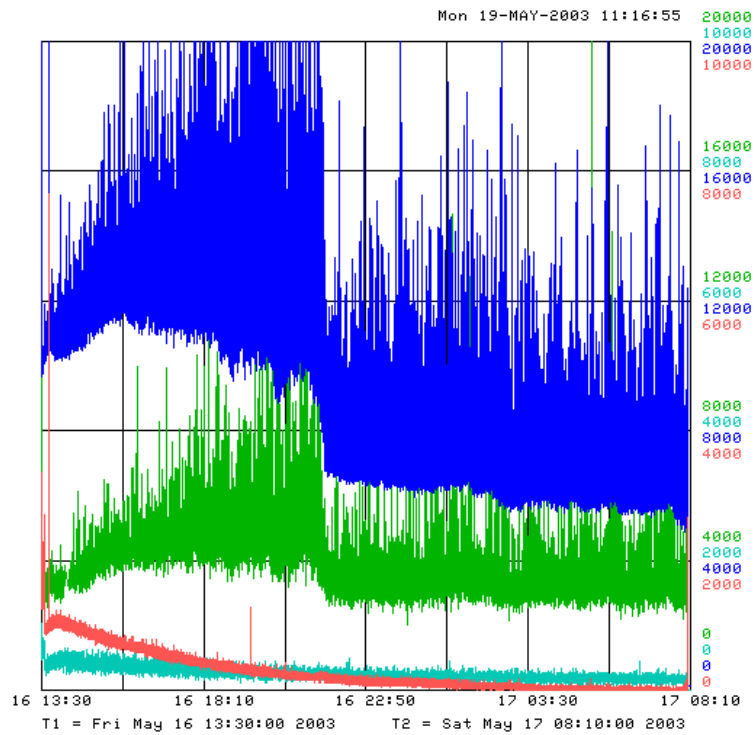
Trigger tests cause 5—10% inefficiency

Proton Losses

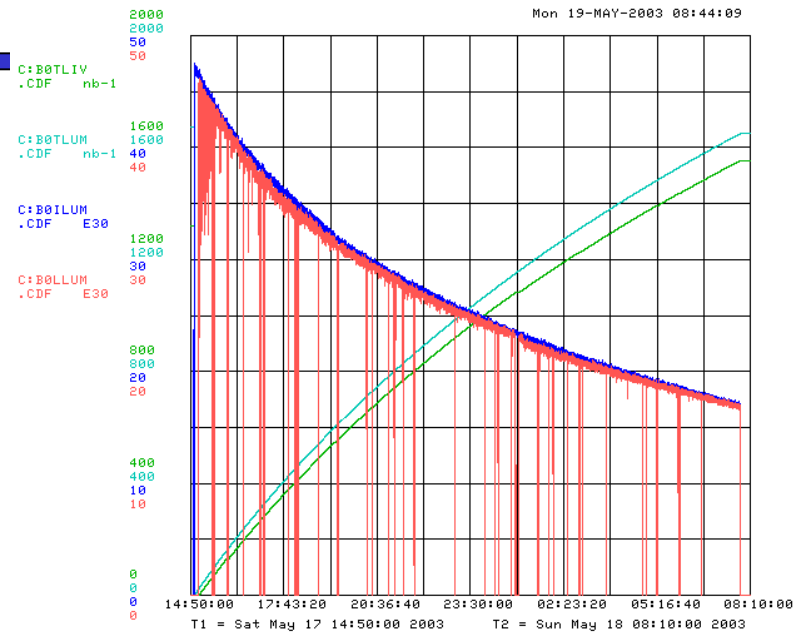
- Proton loss looks getting spiky
  - SVX warning (Not yet serious level)
  - Reduced by changing TeV tune

Store 2555 May/17
L = 47.5e30





Data Taking Efficiency



- CDF is running fine
  - 94% efficiency for store 2555
  - Si is in ~100% of the time
- Data taking efficiency:
  - On tape / Delivered luminosity
  - CDF can write data on tape: ~75Hz
  - Beam crossing is ~2.5 MHz
  - We could make stupid trigger system to accept 1 out of 40K crossing events
    - Much easier to achieve ~95% data taking efficiency
    - No physics content .., we may need ~ 400000 fb^{-1} for finding Higgs : Bad example!
  - We need to maximize physics content of the data as well
- Two important things
  - Bandwidth of the trigger/DAQ system (how much data we can record)
  - Trigger table (physics purity of the data)

CDF Trigger Table

- Current trigger table
  - 44 Level 1 Triggers
  - 106 Level 2 Triggers
  - 161 Level 3 Triggers
- CDF is a multi purpose experiment, triggering on
  - Top, W/Z
  - Jet, Photon, Diffractive
  - Tracking (B physics)
  - Higgs, Susy, new physics …
- Also we need lots of backup triggers and control samples to do analysis

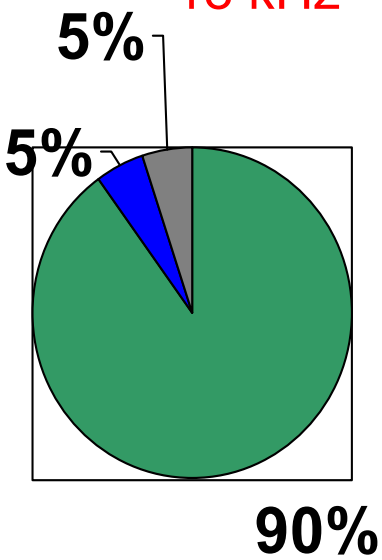
Just the first 1 page of the trigger table spread sheet

Dataset	Path	Level 3	Level2
ALL_RECO_4.8_v3	AAAAA_ALL_RECO_4.8_v2	L3_184_RECO_v1	
ALL_RECO_4.8_v3	MINBIAS_1.3HZ_XRAY_v2	L3_MINBIAS_v1	L2_RL1_NZ_L1_MBTS_v1
B_BACKUP_1_v2	B_HAD_L3TAG_L1_SEVEN_TRK2_v1	L3_NULL_v1	L2_PS200_L1_SEVEN_TRK2_v1
B_BACKUP_1_v2	B_HAD_L3TAG_L1_TWO_TRK2.5_OPPQ_DPHI135_SUMPT6.5_v1	L3_NULL_v1	L2_PS20K_L1_TWO_TRK2.5_OPPQ_D
B_BACKUP_1_v2	B_HAD_L3TAG_L1_TWO_TRK2_v6	L3_NULL_v1	L2_PS1K_L1_TWO_TRK2_v1
B_BACKUP_1_v2	B_HAD_L3TAG_L2_TWO_TRK2_D100_v5	L3_NULL_v1	L2_TWO_TRK2_D100_PS10_v1
B_DIMUON_1_v2	BBBAR_TWO_CMUP3_v3	L3_BBAR_TWO_CMUP3_v2	L2_AUTO_L1_TWO_CMU1.5_PT1.5_v1
B_DIMUON_1_v2	DIMUON_L3PS200_L1_CMU1.5_PT1.5_&_CMX1.5_PT2_v6	L3_NULL_v1	L2_AUTO_L1_CMU1.5_PT1.5_&_CMX1
B_DIMUON_1_v2	DIMUON_L3PS200_L1_TWO_CMU1.5_PT1.5_v3	L3_NULL_v1	L2_AUTO_L1_TWO_CMU1.5_PT1.5_v1
B_DIMUON_1_v2	UPSILON_CMUP_CMU_v3	L3_UPSILON_CMUPCMU_v2	L2_AUTO_L1_TWO_CMU1.5_PT1.5_v1
B_DIMUON_1_v2	UPSILON_CMUP_CMX_v6	L3_UPSILON_CMUPCMX_v2	L2_AUTO_L1_CMU1.5_PT1.5_&_CMX1
B_ELECTRON_2_v2	B_SEMI_CEM4_TRACK2_D120_v11	L3_B_SEMI_CEM4_TRACK2_D120_v8	L2_TRK2_D120_&_CEM4_PT4_CES2_
B_ELECTRON_2_v2	B_SEMI_L2_TRK2_D120_L1_CEM_4_PT4_v2	L3_NULL_v1	L2_TRK2_D120_PS250_L1_CEM4_PT4
B_ELECTRON_2_v2	ELECTRON_CENTRAL_4_NOL2_v3	L3_ELECTRON_CENTRAL_4_PT4_v4	L2_PS500_L1_CEM4_PT4_v1
B_ELECTRON_2_v2	ELECTRON_CENTRAL_4_v8	L3_ELECTRON_CENTRAL_4_PT4_v4	L2_CEM4_PT4_CES2_PS200_v2
B_ELECTRON_2_v2	ELECTRON_CENTRAL_PS5K_L1_CEM4_PT4_v3	L3_NULL_v1	L2_PS500_L1_CEM4_PT4_v1
B_HADRONIC_2_v2	B_CHARM_HIGHPT_L1_SEVEN_TRK2_v5	L3_TWO_TRACK_B_CHARM_v6	L2_B_CHARM_HIGHPT_L1_SEVEN_TF
B_HADRONIC_2_v2	B_CHARM_HIGHPT_v4	L3_TWO_TRACK_B_CHARM_v6	L2_B_CHARM_HIGHPT_v2
B_HADRONIC_2_v2	B_CHARM_L1_SEVEN_TRK2_v8	L3_TWO_TRACK_B_CHARM_v6	L2_B_CHARM_L1_SEVEN_TRK2_v1
B_HADRONIC_2_v2	B_CHARM_LOWPT_v2	L3_TWO_TRACK_B_CHARM_LOWPT_v3	L2_B_CHARM_LOWPT_v1
B_HADRONIC_2_v2	B_CHARM_v11	L3_TWO_TRACK_B_CHARM_v6	L2_B_CHARM_v1
B_HADRONIC_2_v2	B_D0_L1_SEVEN_TRK2_v11	L3_EXPRESS_D0_v2	L2_B_CHARM_HIGHPT_L1_SEVEN_TF
B_HADRONIC_2_v2	B_D0_v11	L3_EXPRESS_D0_v2	L2_B_CHARM_HIGHPT_v2
B_MUON_2_v3	B_SEMI_CMUP4_TRACK2_D120_v12	L3_B_SEMI_CMUP4_TRACK2_D120_v8	L2_TRK2_D120_L1_CMUP6_PT4_v2
B_MUON_2_v3	B_SEMI_L3PS20_L2_TRK2_D120_L1_CMUP6_PT4_v3	L3_NULL_v1	L2_TRK2_D120_L1_CMUP6_PT4_v2
B_MUON_2_v3	MUON_CMUP4_v6	L3_MUON_CMUP_4_v3	L2_PS100_L1_CMUP6_PT4_v1
B_MUON_2_v3	MUON_PS1000_L1_CMUP6_PT4_v2	L3_NULL_v1	L2_PS100_L1_CMUP6_PT4_v1
B_PIPI_1_v2	B_PIPI_HIGHPT_L1_SEVEN_TRK2_v3	L3_TWO_TRACK_B_PIPI_v9	L2_B_PIPI_HIGHPT_L1_SEVEN_TRK2
B_PIPI_1_v2	B_PIPI_HIGHPT_v3	L3_TWO_TRACK_B_PIPI_v9	L2_B_PIPI_HIGHPT_v2
B_PIPI_1_v2	B_PIPI_L1_SEVEN_TRK2_v10	L3_TWO_TRACK_B_PIPI_v9	L2_B_PIPI_L1_SEVEN_TRK2_v3
B_PIPI_1_v2	B_PIPI_v13	L3_TWO_TRACK_B_PIPI_v9	L2_B_PIPI_v2
B_RARE_1_v4	RAREB_CMUCMU_SUMPT_v3	L3_LOWMASS_CMUCMU_SUMPT_v3	L2_AUTO_L1_TWO_CMU1.5_PT1.5_v1

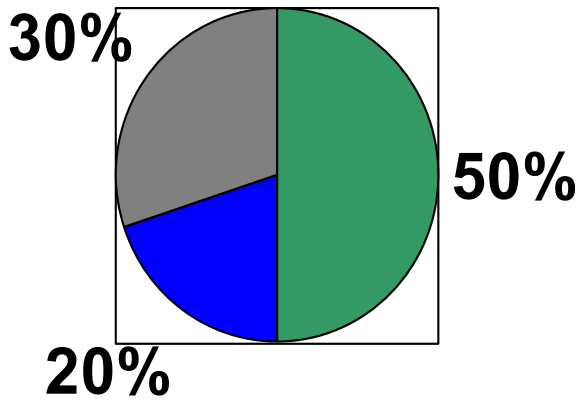
- We need to update Trigger table
  - Luminosity is going up
  - Some triggers are dropped or cut harder
  - Negotiation between physics groups

Trigger Table Market Share

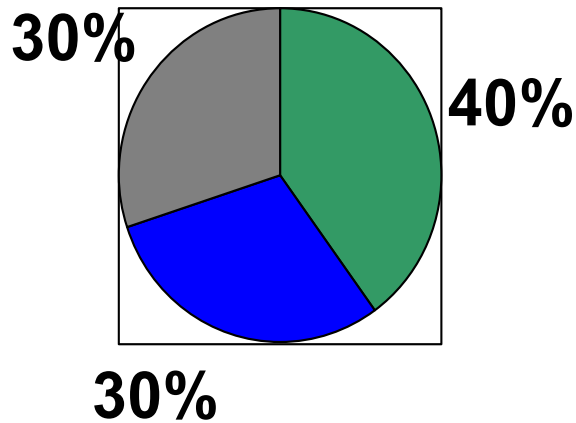
Level 1
18 kHz



Level 2
270 Hz



Level 3
75 Hz
(on tape)



- Green: Tracking trigger : mostly for B physics
- Blue : Lepton triggers: for High p_T physics (top, W, Higgs, etc)
- Gray : Jet and Photon triggers: QCD studies, new particles

Summary/Plan

- CDF is working ok
  - Stable running with ~90% average data taking efficiency
  - Silicon is integrated ~100% of the time
  - Proton loss is getting higher
- Trigger/DAQ system and Trigger table upgrades are going on
  - >95% Data taking efficiency
  - Preparing for the higher luminosity
  - Studies/tests may cost today's 1 pb^{-1}, but it's for tomorrow's 100 pb^{-1}